

Technical Bulletin

Notes on Applying Pattern and Form Releases.

The main objective when applying pattern and form releases is providing a uniform coating without using too much material. This situation has proven to be one where less is more and using too much causes more problems than not using any.

This is not a difficult application, so with a little care you can configure a system that will help your customer improve the performance of his system and use less release material.

Usually it is best to design a spray system around air atomizing nozzles. Hydraulic nozzles without air assistance would have a hard time generating a coating thin and even enough without operating at fairly high pressures. The air atomizers allow much tighter control of the spray, and since they use small amounts of air they normally don't create much of a burden for the shop air system.

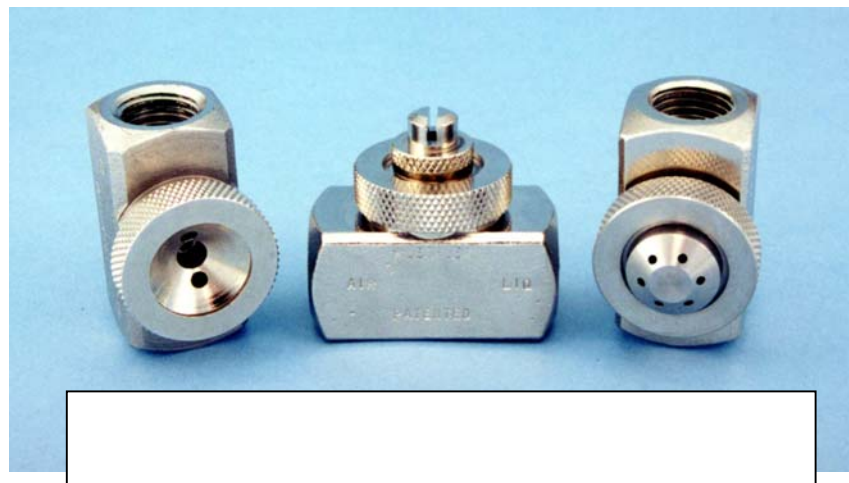
Typically you will encounter two major approaches: Either you are trying to cover a stationary target with a burst of spray or you are trying to apply the coating as the target passes under the nozzle. Each situation will dictate how you calculate the flow rate and distribution to ensure an even coating of the right thickness.

1. Stationary Target Spraying

To cover a stationary target you will usually need a wide-angle full cone such as the spray nozzle shown on the far right of this photo (Wide Angle Nozzle shown on page 13 of our catalog #201).

This family is designed to give a wide even spray and has been used successfully with Hill & Griffith's

AquaPart® II. The Lechler #156.208.35.03 and the #156.210.35.03 are well suited to this application. Look at the flow rates for the liquid pressure at 30 and 40 PSI. This is a good range and falls within the parameters recommended by Hill & Griffith. Not that the air pressure has a



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major effect on the liquid flow even if the liquid pressure does not change! There is a comfort range for the nozzle where the air and liquid work in balance and you will receive the optimum performance. Also note that the coverage changes slightly at the various pressure combinations. This application will require some fine-tuning in the field, but the air atomizers allow changes in the performance by controlling the air and liquid pressure. Calculating flow in this application is not difficult. Assume an optimum coating thickness of .001" times the surface area to determine a volume for each application. This should be converted to gallons. Look at the liquid flow near the center of the performance range and then multiply this time the number of nozzles needed for the coverage. (Use as few nozzles as possible.) Dividing the combined flow in one hour by the flow required per application would indicate how long the nozzles must spray per application. (If you need help, call us. We'll help you work it out.)

2. Moving Target Spraying.

Covering a moving target requires a different approach. Here the nozzles pass over the form and leave a coating as they travel by. Here you want to use a flat fan spray as shown in the center of the photo (listed on page 14 of our catalog #201). Lechler #156.414.35.03 would be a good place to start. Look at the flow rates for the liquid pressure at 30 and 40 PSI. This is a good range and falls within the parameters recommended by Hill & Griffith. Note that the air pressure has a major effect on the liquid flow even if the liquid pressure does not change! There is a comfort range for the nozzle where the air and liquid work in balance and you will receive the optimum performance. Also note that the coverage changes slightly at the various pressure combinations. This application will require some fine-tuning in the field, but the air atomizers allow changes in the performance by controlling the air and liquid pressure. Flat fan spray distribution is not even over the full width of the field. There is more spray toward the center and it tapers off as you reach the edges. This characteristic is designed into the nozzle to allow you to overlap the sprays when you are covering a target wider than one spray can manage. You should design in a 15% overlap when laying out your nozzle configuration. We can help with this if you like. Calculating the flow is a little trickier. Here you must consider the speed at which the target is passing under the nozzle. Assume a coating thickness of .001" times the width of the target. Convert your cubic inch calculation into gallons. This indicates the flow required coating 1 inch of the strip. Multiply that time the speed in inches per minute and that will yield the desired combined flow in gallons per minute. Divide that by the number of nozzles and convert it to gallons per hour and you can pick your nozzle size from the flow rates tables. It sounds more complicated than it is. Call us if you need assistance or if you have any questions.

In both applications, most customers use the air-operated valve shown on page 11 of catalog 201. This allows remote control of the liquid flow and also cleans the liquid orifice with each cycle. You can connect this to the same air line as the atomizing air, but it requires a minimum of 30 PSI to open, (and enough volume to maintain this while the nozzle is running). This valve has a breather, which can introduce dust into the valve in a hostile environment such as a



foundry. We can add a breather filter (with an additional charge) or the customer can do this himself. (Dust did foul a valve in one installation so it will probably happen again.)

Some basic points to remember:

1. Use the fewest nozzles to achieve the required coverage. Not only is this less expensive, It allows you to use larger nozzles which are less prone to clogging.
2. Use the largest piping possible. When working with colloids and emulsions, small bore tubing is asking for clogging problems! Stay at 1/4" or larger. Our nozzles have 1/4" NPT inlets, so there is no reason to skimp on tubing.
3. Keep your air and liquid pressures moderate. You should be able to achieve the desired results with liquid pressures between 20 and 40 PSI and air pressures between 30 and 50 PSI. If you find you need something beyond these ranges, you probably have the wrong nozzle.
4. Running just the atomizing air at low pressure (10 PSI) can help keep the nozzle clear if the environment is really hostile. If you're connected in tandem with the air operated liquid valve, this low pressure will allow the valve to close so the liquid flow will be shut off.



Using some simple design considerations, you can help your customer improve the molding process while saving money through reduced release material consumption. This allows you to add value to the sale and create a happier customer. Good luck!